User Manual

SC121D-TN

PTN Scaler Switcher with Digital Amplifier

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Version: SC121D-TN_2014V1.3

SAFETY PRECAUTIONS

To insure the best from the product, please read all instructions carefully before using the device. Save this manual for further reference.

- Unpack the equipment carefully and save the original box and packing material for possible future shipment
- Follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- Do not dismantle the housing or modify the module. It may result in electrical shock or burn.
- Using supplies or parts not meeting the products' specifications may cause damage, deterioration or malfunction.
- Refer all servicing to qualified service personnel.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Do not put any heavy items on the extension cable in case of extrusion.
- Do not remove the housing of the device as opening or removing housing may expose you to dangerous voltage or other hazards.
- Install the device in a place with fine ventilation to avoid damage caused by overheat.
- Keep the module away from liquids.
- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.
- Do not twist or pull by force ends of the optical cable. It can cause malfunction.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Unplug the power cord when left unused for a long period of time.
- Information on disposal for scrapped devices: do not burn or mix with general household waste, please treat them as normal electrical wastes.

NOTICE: Please read this user manual carefully before using this product. Pictures shown in this manual are for reference only, different model and specifications are subject to real product.

This is a manual for SC121D-TN. It can also be applied to SC121D series scaler switchers including SC121D, SC121D-T and SC121D-N with little adjustment. “T” stands for the HDBT port, “N” stands for the TCP/IP port. If there is no HDBT port or TCP/IP port on your model, please neglect the related descriptions.

This manual is only an instruction for operators, not for any maintenance usage. The functions described in this version are updated till June, 2014. Any changes of functions and parameters since then will be informed separately. Please refer to the dealers for the latest details.

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All product function is valid till 2014-06-09.

Contents

1. Introduction 1
1.1. Introduction to SC121D-TN 1
1.2. Features 1
1.3. Package List 1
2. Panel Description 2
2.1. Front Panel 2
2.2. Rear Panel 2
3. System Connection 3
3.1. Usage Precautions 3
3.2. System Diagram 3
3.3. Connection Procedures 4
3.4. PoC Solution 5
3.5. Applications 6
3.6. Collocation Products 6
4. Operations 7
4.1. Operations of the IR Remote 7
4.2. OSD Operations 8
4.2.1. Picture Setting 8
4.2.2. Audio Setting 9
4.2.3. System Setting 10
4.3. Firmware Update 10
4.4. RS232 Control 11
4.4.1. Installation/uninstallation of RS232 Control Software 11
4.4.2. Basic Settings 11
4.4.3. RS232 Commands 12
4.5. TCP/IP Control 15
4.5.1. Control Modes 15
4.5.2. TCP/IP Settings 16
5. Specification 18
5.1. Specifications of SC121D-TN 18
5.2. Specifications of Video/Audio Input/output 19
5.2.1. C-Video and S-Video input 19
5.2.2. YPbPr input 19
5.2.3. VGA input 20
5.2.4. HDMI input 20
5.3. Audio input/output 20
6. Panel Drawing 21
7. Troubleshooting & Maintenance 22
8. After-sales Service 23

1. Introduction

1.1. Introduction to SC121D-TN

SC121D-TN is a full HD scaler switcher with 12 video, 6 audio & 2 MIC inputs. It scales & switches any video signal HDMI, VGA, YPbPr, C-Video & S-video to HDBaseT, HDMI & VGA simultaneously, and any audio to 2x20W amplifier. It's controllable via the button, IR, RS232 & TCP/IP.

It's a remarkable scaler for education institution, meeting room, conference room, demonstration hall etc with its excellent performance.

1.2. Features

- 12 video Inputs: 4 HDMI, 4 VGA, 1 YPbPr, 2 C-video & 1 S-video.
- 2 MIC inputs with level control and mixer function.
- Upscale to outputs HDBaseT, HDMI & VGA simultaneously up to 1080P.
- HDBaseT output to be paired with receiver TPHD402PR for 60M transmission.
- Built-in 2x20Watt@4Ω digital amplifier (or 2x10Watt@8Ω).
- Output resolution selectable to assure preferred output.
- Output display H/V size: adjustable to settle any overscale problem.
- Output display H/V position moveable.
- MIC volume and line volume adjustable.
- Video parameter setting and preset.
- Powerful OSD function with full control.
- Ultra-switching for instaneous display.
- HDMI1.3 and HDCP compliant.
- Firmware updatable via USB.
- Output freeze function.
- Energize PoC receiver (e.g. TPHD402PR) with PoC function
- Front panel lockout.
- Controllable via receiver TPHD402PR at display end.
- Controllable via button, IR, RS232 & TCP/IP.

1.3. Package List

- 1 x SC121D-TN
- 1 x HDBT Receiver (not included in package contends of SC121D, SC121D-N)
- 2 x Mounting Ears (for HDBT Receiver)
- 4 x Screws
- 3 x Captive Screw Connectors
- 1 x RS232 cable
- 4 x Plastic cushions
- 1 x IR remote (Cell battery is not included)
- 1 x Power Cord
- 1 x User Manual

Notes：Please confirm if the product and the accessories are all included, if not, please contact with the dealers.

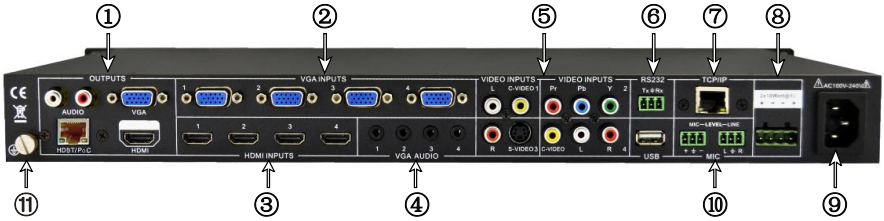
2. Panel Description

2.1. Front Panel

① Power indicating LED. It will illuminate red when the unit is connected with power.
② IR sensor, receive signals sent from of IR remote.
③ Video source selection buttons. You can select video/audio sources by pressing these buttons. And VIDEO source includes three different signals: YPbPr, C-Video and S-Video.
④ Signal channel selection buttons, 4 in total, correspond to the 4 input sources separately.
⑤ Resolution selection buttons. These including 1024×768, 1280x720p, 1280×800, 1360×768, 1920×1080p.
⑥ MIC volume control buttons. “MUTE” for mute MIC volume, “△”for MIC volume up, “▽”for MIC volume down, loop controlling.
⑦ Line volume control buttons. “MUTE” for muting line volume, “△”for line volume up, “▽”for line volume down.

Note: Pictures shown in this manual are for reference only, different model and specifications are subject to real product.

2.2. Rear Panel



① Two RCA connectors for stereo audio output;
One VGA output;
One HDMI output with audio embedded;
One HDBT port (selectable) for HDMI extending (works with TPHD402PR), support

PoC.
② Four VGA connectors for VGA inputs.
③ Four HDMI connectors for HDMI inputs.
④ Four 3.5mm audio connectors for VGA audio inputs.
⑤ One Component video input: Y/Pb/Pr, two composite video inputs: C-Video, one Separate video input: S-Video, two pairs L/R for analog audio input.
⑥ One RS232 port for series control, one USB port for firmware update.
⑦ Two MIC connectors: MIC with pre-amplification, LINE for audio direct input.
One TCP/IP port (selectable): for network controlling.
⑧ Amplifier with 2x10W@8Ω output.
⑨ Connector for POWER.
⑩ Grounding protection.

Note:

- Pictures shown in this manual are for reference only, different model and specifications are subject to real product.
- TCP/IP port and HDBT port are selectable. When there is a TCP/IP port, the switcher may be named as SC121D-N. When there is a HDBT port, the switcher may be named as SC121D-T.

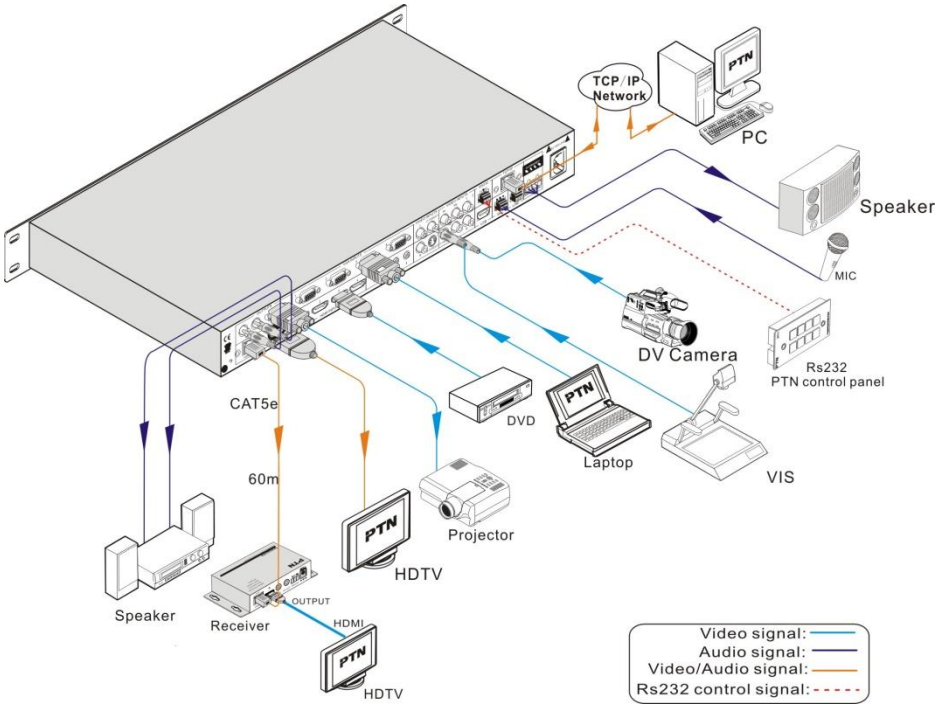
  For example, the name “SC121D-TN” suggests that the switcher has both the two port. While “SC121D” suggests that the switcher has neither a TCP/IP port nor a HDBT port.

3. System Connection

3.1. Usage Precautions

1) System should be installed in a clean environment and has a prop temperature and humidity.
2) All of the power switches, plugs, sockets and power cords should be insulated and safe.
3) All devices should be connected before power on.

3.2. System Diagram



3.3. Connection Procedures

Step1. Connect source devices (e.g. PC, DVD) to video input ports with corresponding cables. For example, connect VGA INPUTS ports and the VGA ports of source devices via VGA cable.

Step2. Connect the corresponding audio source to the corresponding AUDIO INPUT port of SC121D-TN with audio cable separately. C-VIDEO1 shares the same audio input port with S-VIDEO3; YPbPr shares the same audio input port with C-VIDEO4, you can select either side as audio input port.

Step3. Connect a microphone to the MIC input port; plug an audio source device or a wireless microphone to the LINE port.

Step4. Connect a control device (e.g. a PC) to the TCP/IP ports or RS232 sockets of SC121D-TN. Send commands to control SC121D-TN via control software.

Step5. Connect the HDMI HDBT port of SC121D-TN with TPHD402PR to extend the signal.

Step6. Connect display devices to video output ports; connect earphones/amplifiers to audio output ports. (Abiding by the color instruction on output sockets)

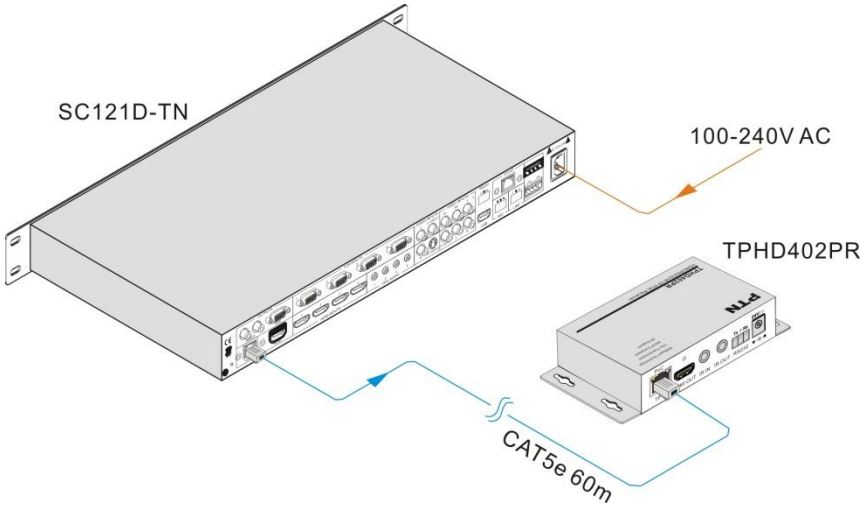
Step7. Connect the output ports of amplifiers to stereo equipments.

Step8. Plug the power cable of SC121D-TN to an AC100V~240V power supply, TPHD402PR is able to get energized with PoC solution.

3.4. PoC Solution

HDBT port supports PoC, which allows SC121D-TN and TPHD402PR share the same power supply and eliminates the need for extra power supply at the remote nodes.

Connect SC121D-TN with TPHD402PR via a CAT5e/6 cable, then plug the power cable of SC121D-TN to an AC100V~240V power supply, TPHD402PR can be energized synchronously with PoC solution, see the picture below:



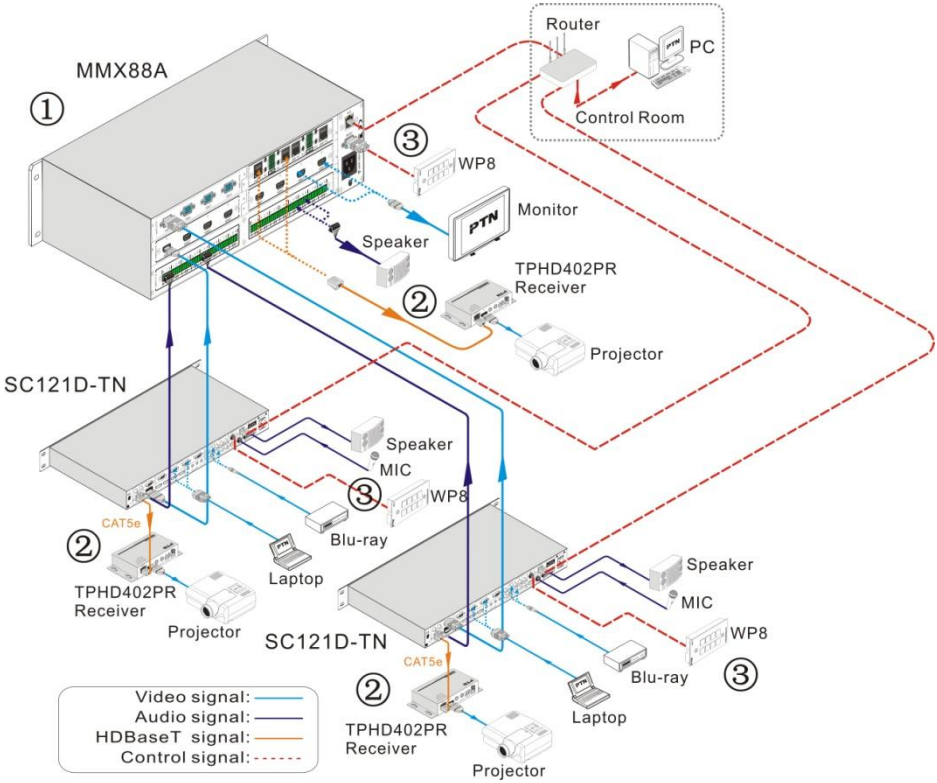
Note: To activate PoC solution, all related parts (including the devices to share the same power supply and connecting cable) should support PoC.

3.5. Applications

SC121D-TN has a good application in various occasions, such as computer realm, monitoring, big screen displaying, meeting room, education and bank & securities institution etc.

3.6. Collocation Products

SC121D-TN usually works with other devices to deliver multiple video& audio sources. Here are the most common collocation products.



Description:

1) MMX88A

- Various I/O cards, includes HDMI, HDBaseT, SD/HD/3G-SDI, DVI and VGA cards (Compatible with YUV, YC & CVBS.) to configure any matrix.
- Support HDMI1.4a, support 3D.
- Integrated HDBaseT technology.
- Controllable via button, RS232 & optional TCP/IP, also compatible with 3rd parties control.

- LCD display.

2) TPHD402PR (HDMI twisted pair Receiver with PoC)

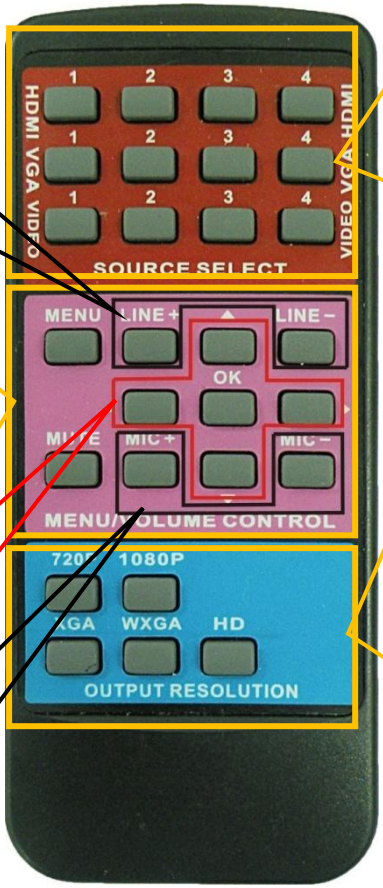
- 60m transmission distance in max over single CAT5e/CAT6 cable.
- Support 1080P@60Hz,48b/pixels,3D & 4Kx2K.
- Support PoC & CEC.
- Bi-directional and simultaneous RS232 & IR control.

3) WP8 (Programmable Control Panel)

- Every button can be programmed to send the bi-direction RS232 and RS485 commands simultaneously to control third party devices.
- Every button can be programmed to send the infrared code, control the relay, to let them work simultaneously to control the third party devices.
- Every button is built in the infrared code and RS232 code learning function, and baud-rate setting.
- ID looping function. 99pcs WP8 can be looped and controlled together, by ID identifying.
- Programmed by USB or RS232, working with PTN PC software (PS-WP).
- Crystal and backlit buttons with easy user-friendly customizable changeable labels.
- The backlit brightness is controllable.

4. Operations

4.1. Operations of the IR Remote



Line volume control area, can work when not in MENU mode.

Menu/ Volume control area, MUTE for line and MIC audio mute.

Direction and OK buttons area, these buttons are available only in MENU mode.

MIC volume control area, can work when not in MENU mode.

Source select area, 12 channels for inputs, including:

4 HDMI

4 VGA

2 C-VIDEO

1 S-Video

1 YPbPr

Output resolution select area, five different resolutions can be selected, including:

720P: 1280x720

1080P: 1920x1080

XGA: 1024x768

WXGA: 1280x800

HD: 1360x768

4.2. OSD Operations

SC121D-TN provides a nice OSD operation menu, with various functions and languages.
The operation introduction is showed as follows.

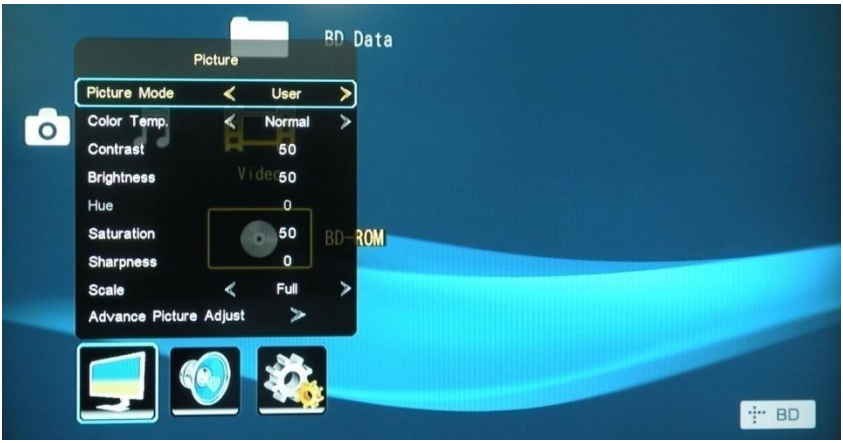
4.2.1. Picture Setting

The first icon from left of the OSD menu is to set the picture parameter. It includes picture mode, color temperature, contrast, brightness, hue, saturation, sharpness, scale, and Advance picture adjust.

Some parameters are available depending on different inputs.

In the item **Advance Picture Adjust**, users can set Digital Noise Reduction, dynamic color, skin tone and Adaptive Luma adjustment function. DNR is suggested to be on, for it can make the output image clear and smooth.

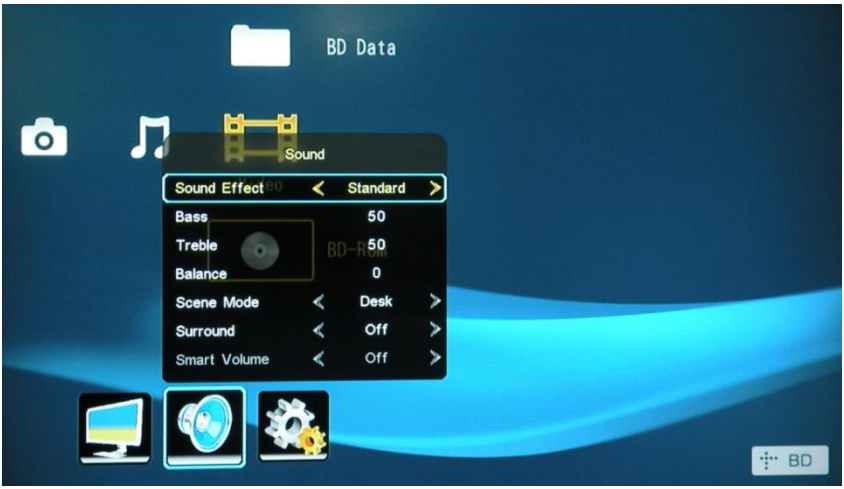
Please check the picture below:



4.2.2. Audio Setting

The Second icon from left of the OSD menu is to set the audio/sound parameter. It includes the sound effect preset, bass, treble, balance, scene mode, surround and smart volume setting. Some parameters are available depending on different inputs.

Please check the picture below:



4.2.3. System Setting

The Third icon from left of the OSD menu is system setting, which includes OSD language setting, listen, freeze, VGA setting, output adjustment etc.

Listen: Audio output only. To resume video output, please press button “MENU”.

VGA setting: Adjust the H/V signal of VGA input, includes auto adjustment.

Output adjustment: Adjust H/V size and H/V position of the output. This function is available only with HDMI and VGA inputs.

4.3. Firmware Update

SC121D-TN supports firmware field-updating by USB flash disk. The operation procedures are:

1) Copy the file “MT23ATV.bin” to a USB flash disk. (The “MT23ATV.bin” file is provided/ authorized by PTN engineering department)
2) Plug the USB flash disk to the USB port on SC121D-TN.
3) Pressing the button “HDMI” on the front panel for 6 seconds or sending RS232 command 0698% for updating, then press the button “OK” on the remote or send RS232 command 0609% to confirm update. SC121D-TN will capture the new firmware from USB flash disk.
4) After finishing update, reboot and send the command “**0617%**” to reset to factory settings.
5) After reset, reboot again.

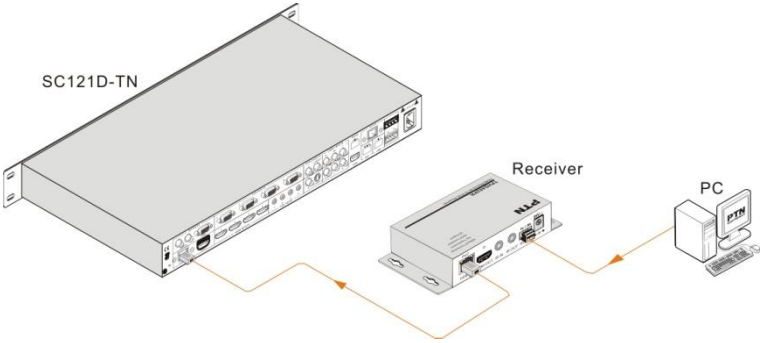
Notice: The name of the update file must be **MT23ATV.bin**.

4.4. RS232 Control

RS232 signal can be transmitted between SC121D-TN and TPHD402PR, it is able to control SC121D-TN from remote.

Control local device from remote:

Connect the RS232 ports of SC121D-TN and TPHD402PR, and connect a control device (e.g. a PC) to TPHD402PR, then it's able to send corresponding commands to control SC121D-TN from remote.



4.4.1. Installation/uninstallation of RS232 Control Software

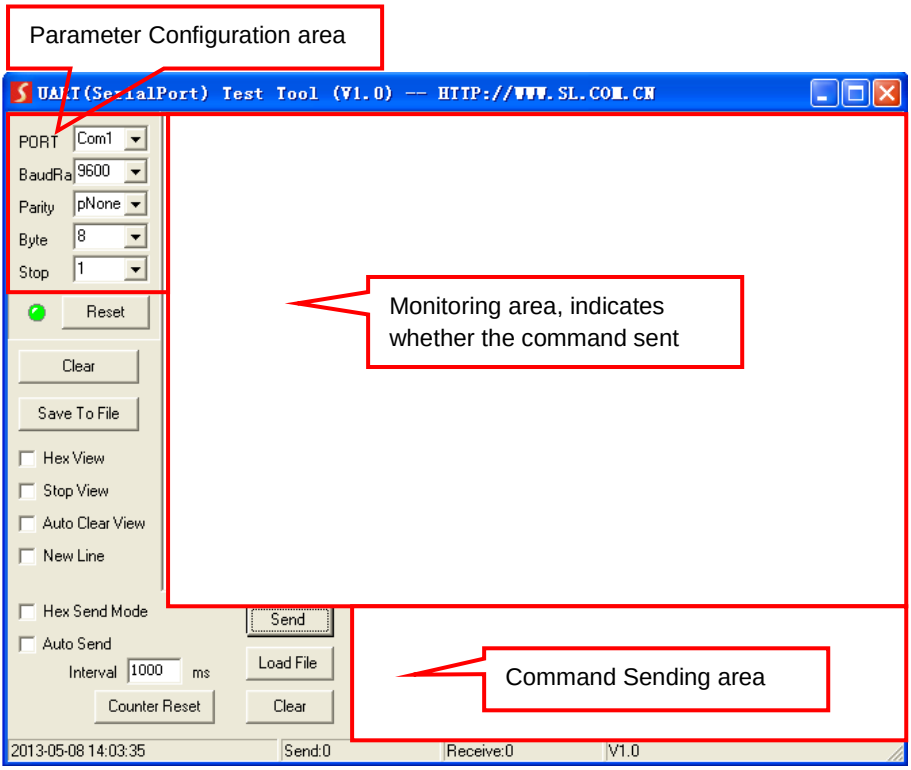
- **Installation** Copy the control software file to the computer connected with SC121D-TN.
- **Uninstallation** Delete all the control software files in corresponding file path.

4.4.2. Basic Settings

Firstly, connect SC121D-TN with all input devices and output devices needed, then connect it with a computer which is installed with RS232 control software. Double-click the software icon to run this software.

Here we take the software **CommWatch.exe** as an example. The icon is showed as below:

The interface of the control software is showed as below:



Please set the parameters of COM number, bound rate, data bit, stop bit and the parity bit correctly, and then you are able to send commands in Command Sending Area.

4.4.3. RS232 Commands

Communication protocol: RS232 Controlling Protocol **Command Type:** ASCII
Baud rate: 9600 Data bit: 8 Stop bit: 1 Parity bit: none

Command	Function Description	Feedback Example
0600%	MUTE Line	LINE Mute On
0601%	UnMute Line	LINE Mute Off
0602%	Audio turn up, XX ranges from 00 to 99.	LINE Volume: xx (xx=0~99)
0603%	Audio turn down, XX ranges from 00 to 99.	LINE Volume: xx (xx=0~99)
0604%	Lock the front panel button	Panel Locked
0605%	Unlock the front panel button	Panel UnLocked
01XX%	Preset the volume. The XX is ranging from	Volume: XX

Command	Function Description	Feedback Example
	00 to 99	
02XX%	Preset the brightness. XX ranges from 00 to 99.	Brightness: XX
03XX%	Preset the contrast. The XX is ranging from 00 to 99	Contrast: XX
04XX%	Preset the saturation. The XX is ranging from 00 to 99	Saturation: XX
05XX%	Preset the sharpness. The XX is ranging from 00 to 07	Sharpness: XX
0606%	Auto-adjust the input signal(VGA only)	VGA Adjustment
0607%	Auto-adjust the color temperature	Color Temp: XX (XX can be cool, normal, warm or user.)
0608%	ZOOM the image, set the aspect ratio	Aspect Ratio: XX (XX can be Full or 4:3.)
0609%	OK, for OSD selection	OK
0610%	Left of OSD	Left
0611%	Right of OSD	Right
0612%	Up of OSD	Up
0613%	Down of OSD	Down
0614%	Set the picture mode	Picture Mode : XX (XX can be user, soft, standard, or Bright.)
0615%	SM Mode	Sound Mode: XX (XX can be user, standard, news, or movie.)
0616%	MENU of OSD	MENU
0617%	Command to reset to factory defaults	Factory reset
0618%	Change the resolution to 1360X768 HD	Resolution: HD 1360X768
0626%	Change the resolution to 1024X768 XGA	Resolution: XGA 1024X768
0627%	Change the resolution to 1280X720 720P	Resolution: 720P 1280X720
0628%	Change the resolution to 1280X800 WXGA	Resolution: WXGA 1280X800
0629%	Change the resolution to 1920X1080 1080P	Resolution: 1080P 1920X1080
0630%	Check the volume level	LINE Volume: XX/MIC Volume: XX

Command	Function Description	Feedback Example
0631%	Check the input source	Source: XXXXXX
0632%	Check the output resolution	Resolution: XXXXXXXX
0633%	Check the image mode	Picture Mode : XX
0634%	Check the audio mode	Sound Mode: XX
0635%	Check the image aspec ratio	Aspect Ratio: XX
0636%	Check the brightness	Brightness: XX
0637%	Check the contrast	Contrast: XX
0638%	Check the saturation	Saturation: XX
0639%	Check the sharpness	Sharpness: XX
0640%	Check the color temperature	Color Temp: XX
0644%	OSD CHANNEL display able	OSD Source: Display
0645%	Shield OSD CHANNEL	OSD Channel (Source): No Display
0646%	Volume Bar display able	Volume Bar: Display
0647%	Volume Bar display unable	Volume Bar: No Display
0648%	Digital audio (HDMI and SPDIF) output able	Digital Sound Ouput: Enable
0649%	Shield digital audio (HDMI and SPDIF) output	Digital Sound Ouput: Disable
0650%	Check OSD CHANNEL display status	OSD Source: Display
0651%	Check Volume Bar display status	Volume Bar: Display
0652%	Check Digital audio output status	Digital Sound Ouput: Enable
0655%	Freeze output image	Freeze: Enable
0656%	Cancel the freezing of output image	Freeze: Disable
0698%	Firmware update	
0701%	Switching to HDMI1 input	Source: HDMI 1
0702%	Switching to HDMI2 input	Source: HDMI 2
0703%	Switching to HDMI3 input	Source: HDMI 3
0704%	Switching to HDMI4 input	Source: HDMI 4
0705%	Switching to VGA1 input	Source: VGA1
0706%	Switching to VGA2 input	Source: VGA2
0707%	Switching to VGA3 input	Source: VGA3
0708%	Switching to VGA4 input	Source: VGA4
0709%	Switching to composite video AV1 input	Source: CVIDEO1
0710%	Switching to YPbPr input	Source: YPbPr
0711%	Switching to S-Video input	Source: SVIDEO
0712%	Switching to composite video AV2 input	Source: CVIDEO2

Command	Function Description	Feedback Example
0720%	Mute Line and MIC	Mute On
0721%	UnMute Line and MIC	Mute Off
0722%	MUTE MIC	MIC Mute On
0723%	UnMute MIC	MIC Mute Off
0724%	MIC volume turn up	MIC Volume: XX
0725%	MIC volume turn down	MIC Volume: XX
08XX%	Preset MIC volume	MIC Volume: XX

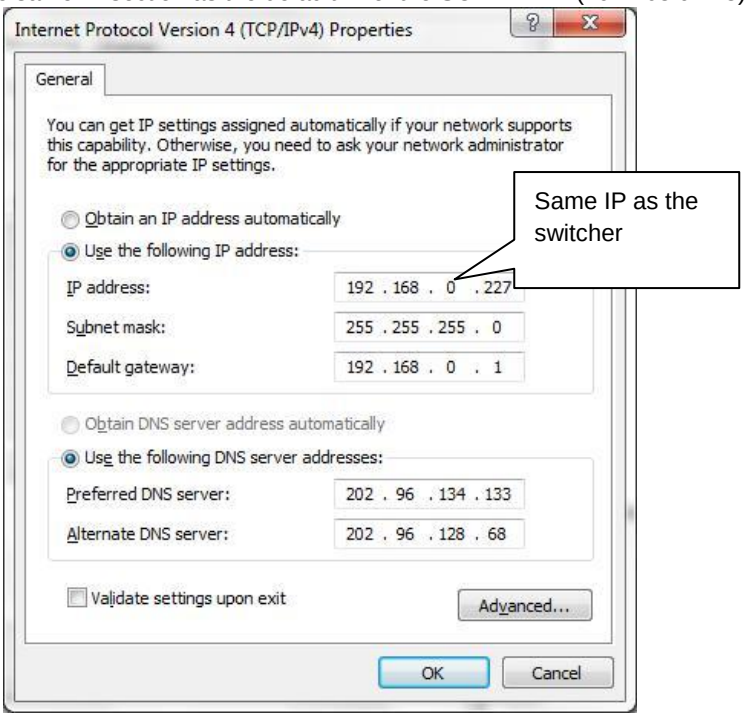
4.5. TCP/IP Control

4.5.1. Control Modes

TCP/IP default settings: IP is 192.168.0.178, Gateway is 192.168.0.1, and Serial Port is 4001. IP & Gateway can be changed as you need, Serial Port cannot be changed.

- **Controlled by Single PC**

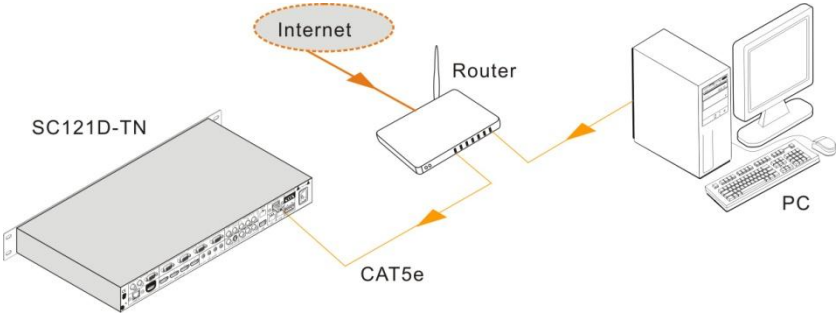
Connect a computer to the TP port of the SC121D-TN, and set its IP address and gateway to the same IP section as the default IP of the SC121D-TN (192.168.0.178).


Internet Protocol Version 4 (TCP/IPv4) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 0 . 227
Subnet mask: 255 . 255 . 255 . 0
Default gateway: 192 . 168 . 0 . 1
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server: 202 . 96 . 134 . 133
Alternate DNS server: 202 . 96 . 128 . 68
Validate settings upon exit
Advanced...
OK
Cancel
Same IP as the switcher

- **Controlled by PC(s) in LAN**

The SC121D-TN can be connected with a router to make up a LAN with the PC(s), this

make it able to be controlled in a LAN. When control, just make sure the SC121D-TN's IP section is the same with the router. Please connect as the following figure for LAN control.



Step1. Connect the TCP/IP port of the SC121D-TN to Ethernet port of PC with twisted pair.

Step2. Set the PC's IP address and gateway to the same IP section as the SC121D-TN. Do please remember the PC's original IP address and gateway.

Step3. Set the SC121D-TN's IP address and gateway to the same IP section as the router.

Step4. Set the PC's IP address and gateway as the original one.

Step5. Connect the SC121D-TN and PC(s) to the router. In the same LAN, each PC is able to control the SC121D-TN asynchronously.

The HDBT port of SC121D-TN is used for TCP/IP control. And all the control commands are the same as the RS232 command list. Here is the detailed introduction.

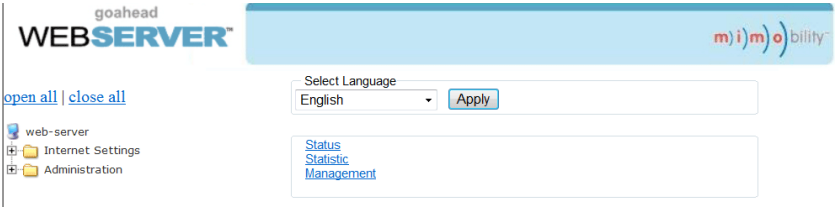
4.5.2. TCP/IP Settings

Step1. Connect the TCP/IP port of the SC121D-TN to Ethernet port of PC with twisted pair.

Step2. Set the PC's IP and gateway to the same IP section as the default IP of the SC121D-TN (192.168.0.178).

Step3. Enter the http://192.168.0.178:100 to the Internet Explorer, you will see the LOGIN page.

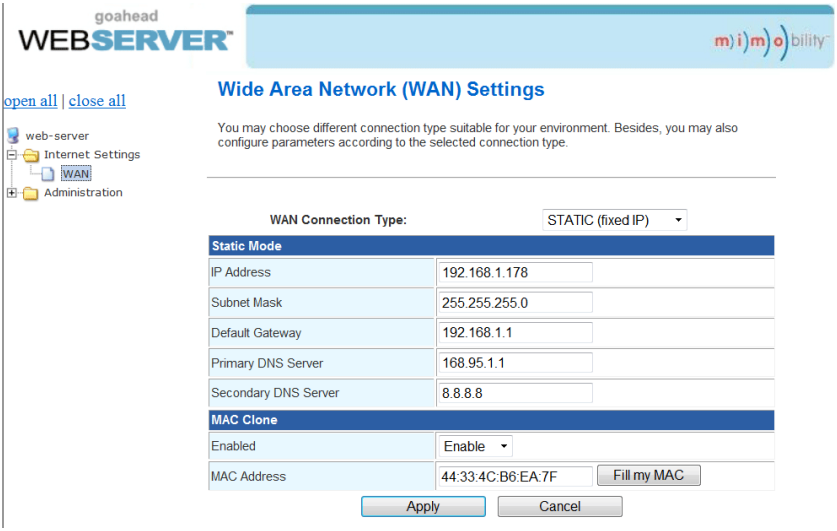
Step4. Enter user name "admin" and password "admin", then press the **Enter** button. (Not the Enter key on your keyboard.) Then you can enter the configuration page to configure the IP port, including the IP reset, Serial reset and password reset etc. As picture below:



Step5. Change IP/Serial Port

- **Change IP**

a) Select the tab "**system info**", and then you are able to change the IP.



b) Press the button **Apply** to save your settings. Then the PC(s) in this LAN (connected with this router) will be able to control the matrix switcher.

- **Change Serial Port**

a) Select the tab "**serial info**", and then you are able to change the serial port.
b) Set the port number to 4001 (unique, other numbers are unavailable).
c) Press the button **Apply** on present page to save your settings.

Step6. Select the tab "**reset device**", then your settings will be loaded to the SC121D-TN.

5. Specification

5.1. Specifications of SC121D-TN

Video Input		**Video Output**	
Input	4 HDMI 4 VGA 1 YPbPr 2 C-Video 1 S-Video	Output	1 HDMI 1 VGA 1 HDBT
Input Connector	HDMI female connector VGA(15 pin HD), female connector RCA female connector 4 pin mini DIN connector	Output Connector	HDMI female connector VGA(15 pin HD), female connector RJ-45 connector
Video Signal	HDMI 1.3, RGBHV, RGBs, RGsB, RsBsGs, NTSC 3.58, NTSC 4.42,PAL,SECAM	Video Signal	HDMI 1.3 VGA HDBase-T
Video General			
Resolution Range	1080P,1920*1080 ; HD, 1360*768 720P, 1280*720; WXGA,1280*800 ; XGA, 1024*768.	Bandwidth	HDMI: 4.95Gbps(1.65Gbps per color) C-Video/S-Video: 150MHz YPbPr: 170MHz VGA: 375MHz
Maximum Pixel Clock	145MHz	Video Impedance	75Ω
Gain	0dB	I/O Level	0.5V~2.0Vp-p
HDCP management	Compliant with High-bandwidth Digital Content Protection(HDCP) with DVI & HDMI 1.3 standards		
Audio Input		**Audio Output**	
Input	6 Stereo Audio for line audio 2 MIC audio	Output	Stereo audio for line audio 2x10W@8Ω/2x20W@4Ωamplifier
Input Connector	4 RCA female connector for YPbPr, C-Video & S-Video audio	Output Connector	RCA connector Amplifier connector

	4 3.5mm jack for VGA audio HDMI for HDMI embedded audio		
Audio Input Impedance	>10kΩ	Audio Output Impedance	75Ω
Audio General			
CMRR	>90dB @20Hz to 20K Hz	Stereo Channel Separation	>80dB @1KHz
Frequency Response	20Hz~20K Hz		
Control Parts			
Control/Remote	IR remote, Buttons & RS-232, TCP/IP	Pin Configurations	2 = TX, 3 = RX, 5 = GND
General			
Temperature	-10 ~ +40℃	Humidity	10% ~ 90%
Power Supply	100VAC ~ 240VAC, 50/60Hz	Power Consumption	65W
Dimension (W* H*D)	483 x 44x 235mm	Weight	2.2Kg

5.2. Specifications of Video/Audio Input/output

5.2.1. C-Video and S-Video input

- Supporting PAL/SECAM/NTSC format
- Changeable aspect ratio. (Full-screen, wide screen, 4:3)
- Color RGB adjustable

5.2.2. YPbPr input

Input Resolution	Display Parameter				
	Frame frequency		Frame frequency		Frame frequency
720×480 I	2:1	525	15.75	60	4:3
720×480 P	1:1	525	31.5	60	4:3
720×576 I	2:1	625	15.625	50	4:3
720×576 P	1:1	625	31.25	50	4:3
1280×720P	1:1	750	45	60	16:9
1280×720P	1:1	750	37.50	50	16:9
1920×1080 I	2:1	1125	28.125	50	16:9

1920×1080 I	2:1	1125	33.75	60	16:9
1920×1080 I	2:1	1250	31.25	50	16:9
1920×1080 p	1:1	1250	62.5	50	16:9
1920×1080 p	1:1	1250	67.5	60	16:9
The bandwidth is up to170MHz					

- Changeable aspect ratio. (Full-screen, wide screen, 4:3, auto-adjust)
- Supporting HDTV input

5.2.3. VGA input

The VGA resolution is VESA standard, supporting:

No.	Resolution	No.	Resolution
1	640×480@60 Hz	8	1024×768@70 Hz
2	640×480@72 Hz	9	1024×768@75 Hz
3	720×400@70 Hz	10	1280×1024@75 Hz
4	800×600@60 Hz	11	1280×768@60Hz
5	800×600@72 Hz	12	1360×768@60 Hz
6	800×600@75 Hz	13	1920×1080
7	1024×768@60 Hz		

- The bandwidth is up to 375MHz.
- The following audio can adjust bass/treble
- Changeable aspect ratio. (Full-screen, 4:3)

5.2.4. HDMI input

HDMI resolution support:

No.	Resolution	No.	Resolution
1	640×480@60Hz	9	1024×768@70 Hz
2	640×480@72Hz	10	1024×768@75 Hz
3	640×480@75Hz	11	1280×1024@75Hz
4	800×600@56Hz	12	1360×768@60Hz
5	800×600@60 Hz	13	1920×540@60Hz
6	800×600@72 Hz	14	1920×1080I@60Hz
7	800×600@75Hz	15	1920×1080P@60Hz
8	1024×768@60 Hz		

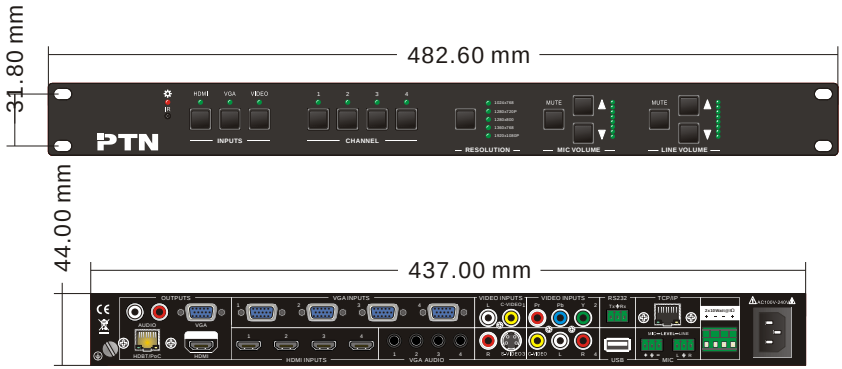
- Digital embedded audio decoding.
- Changeable aspect ratio (Full-screen, wide screen, 4:3, auto-adjust).
- Support HDCP1.3, compatible with DVI signal.

5.3. Audio input/output

- 2 pairs of L/R analog audio input, 4 VGA audio and 2 MIC audio inputs
- 2x10W@8Ω amplifier output. L/R stereo audio output and HDMI embedded audio.

- Volume/Bass/Treble adjustable
- Audio status presets, changeable scene mode (Wall-mounted, Desk)

6. Panel Drawing



7. Troubleshooting & Maintenance

Problems	Causes	Solutions
Color losing or no video signal output in HDMI display	The connecting cables may not be connected correctly or it may be broken	Check whether the cables are connected correctly and in working condition.
No HDMI signal output in the device while local HDMI input is in normal working state		
Output images in display show with ghost	Incorrect setting on the display	Check the display's setting
	A cable of bad quality	Try another high quality connection cable
No output image when switching	No signal at the input / output end	Check with oscilloscope or multimeter if there is any signal at the output end.
	Fail or loose connection	Make sure the connection is good
	The extender is broken	Send it to authorized dealer for repairing.
Cannot control the device with IR remote	The battery has no power	Change for another battery.
	The IR remote is broken	Send it to authorized dealer for repairing.
Cannot control the device by control device (e.g. a PC) through RS232 port	Wrong RS232 communication parameters	Make sure the RS232 communication parameters are correct.
	The device is broken	Send it to authorized dealer for repairing.
Static becomes stronger when connecting the video connectors	bad grounding	Check the grounding and make sure it is connected well.

If your problem persists after following the above troubleshooting steps, seek further help from authorized dealer or our technical support.

8. After-sales Service

If there appear some problems when running SC121D-TN, please check and deal with the problems referring to this user manual. Any transport costs are borne by the users during the warranty.

1) **Product Limited Warranty:** PTN warrants that its products will be free from defects in materials and workmanship for **three years,** which starts from the first day you buy this product (The purchase invoice shall prevail).
   Proof of purchase in the form of a bill of sale or receipted invoice which is evidence that the unit is within the Warranty period must be presented to obtain warranty service.
2) **What the warranty does not cover:**
   - Warranty expiration.
   - Factory applied serial number has been altered or removed from the product.
   - Damage, deterioration or malfunction caused by:
     - Normal wear and tear
     - Use of supplies or parts not meeting our specifications
     - No certificate or invoice as the proof of warranty.
     - The product model showed on the warranty card does not match with the model of the product for repairing or had been altered.
     - Damage caused by force majeure.
     - Servicing not authorized by PTN
     - Any other causes which does not relate to a product defect
   - Delivery, installation or labor charges for installation or setup of the product
3) **Technical Support:** Email to our after-sales department or make a call, please inform us the following information about your cases.
   - Product version and name.
   - Detailed failure situations.
   - The formation of the cases.

Remarks: For any questions or problems, please try to get help from your local distributor, or email PTN at: support@PTN-electronics.com.

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